

MINISTRY OF THE INTERIOR, EGYPT

Department of Public Health

Research Institute and Endemic Diseases Hospital



Second Annual Report  
1932

Government Press, Cairo, 1934.

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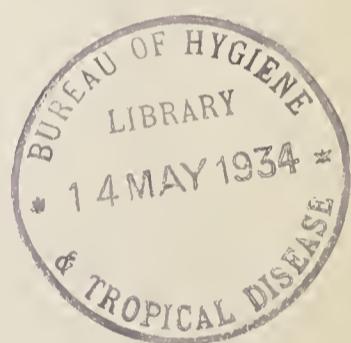
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H.M. The King in Visiting the Institute



H.M. The King signs the Special Visitors Book



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*Cairo, March 30, 1933.*

EXCELLENCY,

I have the honour to submit my report on the Research Institute and the Endemic Diseases Hospital and the work done during the year 1932.

I have the honour to be,

Excellency,

Your obedient servant,

Dr. M. KHALIL BEY,

*Director Research Institute.*

H.E. THE UNDER SECRETARY OF STATE,  
DEPARTMENT OF PUBLIC HEALTH,  
MINISTRY OF THE INTERIOR,  
CAIRO.





General view of the Research Institute and the Endemic Diseases Hospital



THE RESEARCH INSTITUTE AND THE ENDEMIC  
DISEASES HOSPITAL, CAIRO

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MINISTRY OF THE INTERIOR, EGYPT

Department of Public Health

The Research Institute and the Endemic Diseases Hospital

Second Annual Report, 1932

FOREWORD

This is the second year since the Institute occupied its new premises. The staff is approaching its full number. The activities of the Institute can be grouped under three main headings :—

1. Scientific Research.
2. Field Work.
3. Clinical Work.

(1) *Scientific Research.*

The Scientific Research is carried out at present in four different sections :—

- (a) Biochemistry.
- (b) Clinical and Experimental Pathology.
- (c) Helminthology and Protozoology.
- (d) Medical Entomology.

A large well stocked animal house is placed at the disposal of these sections. An insect room is placed under the direction of the Medical Entomologist. A concrete basin for keeping fishes, snails and other water fauna and flora, is placed at the disposal of the Helminthology Section.

(2) *Field Work.*

Members of the Institute are delegated from time to time to make field studies of certain problems. During this year, four such studies were made :—

- (a) A village near Cairo, Kafr Ghatati, was studied in detail from the Parasitological point of view, specially as regards Filariasis and its transmission. The mosquito intermediate host was identified for the first time in Egypt. The effect of several sanitary reforms on the spread of Parasitic infections is being observed.
- (b) Another Filariasis centre in the Delta, at Kom el Nour, was studied to collaborate the results found in the first survey.
- (c) A suspected focus of skin Leishmania in the Delta was surveyed.
- (d) Parasitic infections in two Egyptian Oases, Baharia and Farafra, were investigated. These are very isolated localities. It was found that Schistosomiasis infection was rife in Baharia, but absent in Farafra.

(3) *Clinical Work.*

The Clinical Work of the Institute is carried out on outpatients as well as on inpatients. The number of new cases admitted to the Outpatients Department is limited to 45 cases a day. This is the maximum number that can be dealt with. Twenty beds are available for the inpatients. On these, special observations and investigations are carried out.

The results of the work of the Institute are published in the current periodicals, principally in Egypt, England, France and Germany. The annual report gives the list of publications and a resumé of the work. Reprints when available are sent to persons interested on application.

Steps are at present being taken to attach to the Institute a Malaria Experimental Station near Cairo.

## THE OFFICIAL OPENING CEREMONY OF THE RESEARCH INSTITUTE AND THE ENDEMIC DISEASES HOSPITAL IN THE PRESENCE OF HIS MAJESTY KING FOUAD I

His Majesty King Fouad I most graciously inaugurated the Research Institute and the Endemic Diseases Hospital on Saturday, April 9th 1932.

His Excellency Dr. Mohammed Shahin Pacha read a speech before His Majesty, outlining the History of the Institute. The cost of the building amounted to L.E. 9,550 and the equipment to L.E. 1725. The outpatient clinic was opened for patients in February 1931.

In the Institute, His Majesty saw the following exhibits :—

- (1) Illuminated boxes containing 200 lantern slides illustrating the life-history and means of prevention of Ancylostoma and Bilharzia.
- (2) Apparatus used in determining albumin and globulin in the blood of patients suffering from Bilharzia and Splenomegaly.  
(Results were published in Bull. de la Soc. Path. Exct., T. XXV, No. 2, Feb. 1932, pp. 149–157).
- (3) Fractional distillation of oil of chenopodium under reduced pressure to separate the active principle.  
(Published in the Journal of the Egyptian Medical Association, 1930).
- (4) Estimation of antimony in the excreta of the Schistosomiasis cases.  
(Published in the Arch. f. Schiffs-und Tropenhygiene, 1931).
- (5) Estimation of minute quantities of copper in water treated with copper sulphate to kill snails.  
(Published in Report No. 6 of the Public Health Laboratories, 1924).
- (6) Entomological demonstration showing the microscopical anatomy of various larvae.
- (7) The life-history of Schistosoma. Pathological specimens showing the lesions of Schistosomiasis.
- (8) Ancylostoma duodenale and its life-history.  
Baermann's apparatus for the recovery of Ancylostoma larvae from the soil.
- (9) Egyptian Mollusca. The effect of copper sulphate on the snails.
- (10) The Intestinal Helminths of man in Egypt.
- (11) The publications issued from the Institute since 1923 to 1931. The number is 95.
- (12) The Insect House containing :—
  - (a) Anopheles mosquitoes.
  - (b) Culex pipiens, the transmitter of Filaria in Egypt.
  - (c) Gambusia affinis fish which feeds on mosquito larvae.
  - (d) Cyprinidon fish and Tilapia nilotica.
  - (e) Combating mosquito larvae by Paris green.
  - (f) Malaria parasites in human blood.
- (13) Clinical examination of patients suffering from Helminthic infections.
- (14) Microscopical examination for excreta for Helminth infection.
- (15) Exhibition of the drugs used in the treatment of Parasitic infections in Egypt.
- (16) Special apparatus for treating Schistosomiasis cases with Fouadin on a large scale.

(17) The discovery of the life-history of *Filaria bancrofti* in Egypt :—

- (a) Elephantiasis of leg.
- (b) Elephantiasis of Scrotum.
- (c) Living microfilaria in blood.
- (d) Developing microfilaria in the *Culex pipiens* mosquito.

(18) New skin reaction for the diagnosis of Schistosomiasis.

(Published in the Journal of the Egyptian Medical Association, April 1932).

(19) Inpatients wards.

His Majesty, at the end of the visit, signed the special visitors book and expressed his satisfaction of the work done

PART I  
REPORT ON THE SCIENTIFIC WORK

SECTION I.—Biochemical Section

1.—*Skin Reaction in Human Schistosomiasis* :—

Fairley and Williams in 1927 used for the intradermal reaction in *Schistosoma haematobium* infection an extract of the liver of snails infected with *Schistosoma spindalis*. This antigen, however, was not satisfactory owing to the fact that uninfected snail liver extracts also gave a positive reaction in a certain percentage of normal people.

A search for a more satisfactory antigen was conducted ; and the preceding difficulty was overcome by preparing the antigen from adult *Schistosoma bovis* from cattle. This Schistosome is found frequently in the Cairo Slaughter House, especially in Sudanese cattle. This new antigen gave more reliable and quite satisfactory results.

Forty-two persons who were definitely known to be free from Schistosome infections (past infection included), all gave negative results. These were mostly Europeans who did not pass a long time in Egypt.

Out of 132 patients who were proved to be infected with Bilharziasis, 128 gave positive immediate reaction. Two cases showed a delayed reaction after 24 hours.

(Published in the Journal of the Egyptian Medical Association, April 1932).

2.—*The Treatment of Schistosomiasis with Bismuth* :—

A course of injections of Neo-Tropol which contains 0.08 grm. precipitated bismuth per c.c. was administered to a patient suffering from *Schistosoma haematobium* infection. This patient received 18 injections at three days interval, and the total volume injected was 30 c.c. The patient tolerated the course well, but no reduction in the number of living ova passed could be observed. Owing to this negative result, the trial of the drug was discontinued.

(Published in the Journal of the Egyptian Medical Association, January, 1933).

3.—*The Susceptibility of Bilharzia Miracidia to different Salts and different p.H.* :—

Experiments were carried out to find the lethal effect of different salts and different hydrogen ion concentrations on the miracidia of *Schistosoma haematobium* and *Schistosoma mansoni*. It was found out that :—

(a) Both *Schistosoma haematobium* and *Schistosoma mansoni* miracidia were susceptible to different hydrogen ion concentrations.

(b) The following salts killed the miracidia in 4 hours :—

Sodium Chloride	...	...	...	...	...	...	...	...	...	...	...	...	0·9 %
Potassium Chloride	...	...	...	...	...	...	...	...	...	...	...	...	0·7 %
Magnesium Chloride	...	...	...	...	...	...	...	...	...	...	...	...	0·7 %
Ammonium Chloride	...	...	...	...	...	...	...	...	...	...	...	...	0·7 %
Calcium Chloride	...	...	...	...	...	...	...	...	...	...	...	...	0·5 %

(c) The miracidia are very susceptible to slight acidity, a solution of p.H. 5 kills the miracidia in 30 minutes, while they survive in a solution of p.H. 11 for half an hour.

(Published in the Journal of the Egyptian Medical Association, 1933).

4.—*The following Problems are still under investigation* :—

- (1) The effect of Treatment with Antimony Compounds on the Liver.
- (2) The Blood Chemistry in pure cases of *Ancylostoma duodenale* infections.
- (3) The gastric function in Helminthic infections.

Reference to the above investigations together with a short discussion of the results obtained are included in the General Clinical Report.

## SECTION 2.—Clinical and Experimental Pathology Section

This Section started in July 1932. A special room was arranged for embedding, section cutting and staining. A Laboratory Assistant was especially trained for this work and all solutions and stains prepared. Material obtained up till now has been mainly from experimental animals.

There is a project for establishing a Post-Mortem room.

Another Laboratory Assistant was trained for obtaining blood specimens from patients and animals, staining and preparing material for examination. This Section is engaged in carrying out investigations, clinical and therapeutic, on hospital patients (inpatients and out-patients), as well as on experimental animals.

In addition to definite problems taken for continuous detailed study, every inpatient is thoroughly investigated both from the Clinical and Laboratory points of view.

The main problems under study in this Section since July 1932 are :—

### 1.—*Helminthic Anaemias* :—

Incidence, types, mechanism of production and treatment —these are discussed in the Clinical Report. In addition, attempts at its experimental production by heavily infecting dogs with *Ancylostoma caninum* and monkeys with *Schistosoma mansoni* for long periods with repeated blood examinations, are also carried out.

### 2.—*Gastric Functions in Helminthic Infections* :—

This work is carried out in combination with the Biochemical Section.

Clinical study of gastric symptoms and signs, fractional test meals and X-rays in some cases, are carried out in various helminthic infections before and after expulsion of parasites. It is intended to study the rôle played by these parasites in disturbing gastric functions. Data will be published later.

### 3.—*Action of Fouadin on* :—

- (a) *Liver*.—(Together with the Biochemical Section). *See Clinical Report.*
- (b) *Organic Heart Disease*.—(*See Clinical Report*).
- (c) *Blood Pictures*.—(*See Clinical Report*).

### 4.—*Treatment of Malaria by Atebrine*.—(*See Clinical Report*).

### 5.—*Post Bilharzial Cystitis* :—

Rôle of bacteria, cystoscopic picture and therapeutical trials of drugs and ketogenic diet are carried out. (*See Clinical Report*).

Other Clinical, haematological and therapeutic studies on Pellagra, Filariasis, Amoebic Dysentery, are also carried out as the supply of cases permit until sufficient data are available for publication.

## EXPERIMENTAL PROBLEMS

### 6.—*Effect of Thorotrast on the Functions of the Reticulo-Endothelial System* :—

(Continuation of the work started in the Hamburg Tropical Institute).

This is a drug used for Hepatosplenography. Its effect is tried before attempt at its use in Tropical Splenomegaly.

### 7.—*Effect of Experimental Bilharzia Infection on the Liver and Spleen of White Rats* :—

- (a) *On Histological Structure*.—Livers and Spleens of infected rats with one sex and mixed sex infection are obtained at different intervals.

(b) *On Functions of Reticulo-Endothelial System.*—Effect on possible mobilisation of Latent Bartonella infection in white rats; preliminary to this, a series of rats from laboratory stock were splenectomised and incidence of latent bartonella infection was demonstrated in 40 per cent. From this stock, rats were infected with Bilharzia and their blood examined at intervals for Bartonella bodies and evidence of haemolytic macrocytic anaemias.

8.—Search for *Bartonella*-like bodies in various local animals.

For this purpose, Hedge-hogs, Bats, Rabbits, etc., were splenectomised and their blood examined daily for appearance of *Bartonella*-like bodies and evidence of haemolytic Anaemia.

### SECTION 3.—Helminthology and Protozoology Section

#### 1.—*Prevention of Bilharzia:*—

(a) *Dakhla Oasis*.—The village of Rashda, where the campaign against the molluscs was conducted by using copper sulphate, was resurveyed twice this year, with the result that no snail carriers of *Schistosoma haematobium* were found. No further cases of urinary Schistosomiasis were reported among the inhabitants of the village. This is the third year since the campaign was undertaken. (See Public Health Laboratories Reports for 1929 and 1930).

(b) *Rowing Pond in Kobba Royal Palace*.—The source of water of this Pond was substituted. Water, now, is derived from the Heliopolis Artesian Wells, thereby avoiding possible contamination of the pond with snails or cercariae coming with the infected water from the Nile. This, together with the measures taken last year against the molluscs that were in the pond, was sufficient to ensure their complete eradication. This place was visited once in February and then in July 1932, and no molluscs were found, (See Report of the Institute for 1931).

## 2.—*Trematode Infection of the Egyptian Molluscs* :—

This subject is still under investigation. Snails from different localities were brought and submitted to examination. Different cercariae, previously recorded by Sonsino 1892, Looss 1896 and Leiper 1915, were found. Several attempts were made to breed the adult worms. This was successful in one case, and a paper on "Prohemistomum orvax (Sonsino 1892) and its development from cercaria vivax (Sonsino 1892) will appear in the "Zeitschrift fuer Parasitenkunde".

Later in October 1932, a consignment of *Melania tuberculata* snails was brought from the Dakhla Oasis. Examination revealed, besides an infection with *cercaria cellulosa* (Looss 1896), an infection with a new species of *Schistosome* cercaria which will be fully described and published later.

Lately, there has been a controversy about the morphology of the cercaria of *schistosoma haematobium*. It was found essential to restudy the subject to settle this conflict of opinion. Unfortunately, the natural infection in *Bulinus* snails is scarce. It was found advisable to make artificial infection. The snails were brought in sufficient numbers from the unfiltered water reservoirs of the Cairo Water Works which serves as an excellent place for their breeding, and also from the Fayoum Province, where they abound. They were then subjected to infection by putting them in contact with living ova of *Schistosoma haematobium* in a sufficient volume of water in aquaria containing vegetations.

### 3.—*New Drugs in the Treatment of Helminthic Infections* :—

(a) The Firm of Bayer Meister Lucius—Leverkusen, Germany, have manufactured a mixture of pure Carbon Tetrachloride (issued in capsules under the name of Seretin), Ascaridol and K. 1750, which is a derivative of Resorcinol. The dosage of an adult weighing 60 kilos was as follows :—

									grm.
Seretin	...	...	...	...	...	...	...	...	.06
Ascaridol	...	...	...	...	...	...	...	...	.01
K. 1750	...	...	...	...	...	...	...	...	.15
									grm. per kilo body weight.

This combination was tried in cases of different Helminthic infections with good results in Ascaris infections only, but it was very disappointing in the cases of Ancylostoma and Taenia saginata infections. Its disadvantage lies in its great bulk and thus it is very inconvenient in mass treatment.

(b) *Hexylresorcinol*.—Following the experiments and results reported from America by Lamson, Caldwell, Brown and Robbins, the drug was tried on outpatients of the hospital attached to the Institute. The drug was issued in chocolate coated pills, each containing 2 grms. The dose varied from 0.8 to 1.4 grms. 33 cases of Ascaris infection were treated. 69 per cent were cured after the first dose, 90 per cent were cured after the second dose and 100 per cent were cured after the third dose. In Ancylostoma, only one case out of 26 was negative after the first dose. It is very efficacious in cases of *Enterobius vermicularis* (repeated dosage) and *Trichocephalus*. In cases of infection with the trematode *Heterophyes heterophyes*, it has no effect (Published in the Journal of the Egyptian Medical Association, No 9, September 1932, pp. 635-637).

#### SECTION 4.—Medical Entomology Section

The work of this Section was started on March 31, 1932. The first object was to equip the Insectarium and Laboratory with the necessary requirements.

The work done in this Section falls under two main headings :—

- I.—Studies on the Immature Stages of Mycetophilidae (Dipt. nemat.).
- II.—Studies on the Mosquitoes of Egypt.

##### 1.—*Mycetophilidae* :—

The larval morphology of eleven species of Mycetophilidae with notes on their biology has been completed. These are :—

1. *Sciara aurepelia*.
2. *Sciara fenestralis*.
3. *Mycomyia wankowiczii*
4. *Monoclana rufilatera*.
5. *Boletina* sp.
6. *Rhymosia domestica*.
7. *Rhymosia gracilipes*.
8. *Trichonta falcata*.
9. *Trichonta vitta*.
10. *Plastosciara perniciosa*.
11. *Mycotopila punctata*.

Most of these larvae have not been described before. This work will be published in the Philosophical Transactions of the Royal Society of London.

A detailed study on the Morphology and Biology of *Pnyia scabiei* was carried out. The work will be published in the Bulletin de la Société Royale Entomologique d'Egypte.

The study of the immature stages of the following insects is almost complete and will be published soon :—

1. *Psiolosciara schineri*.
2. *Dynatosoma fuscicorne*.
3. *Bolitophila hybrida*.

##### 2.—*Studies on the Mosquitoes of Egypt* :—

Under this heading, the following subjects are under investigation :—

1. The Biology and Morphology of *Aedes argenteus*—the Yellow fever mosquito.
2. Artificial feeding of Mosquitoes.

(1) *Aedes Argenteus*.—A single female mosquito was caught in the Laboratory on October 2, 1932. On the following day, it laid 68 eggs. Six adults were bred out in six breeding jars: each jar containing a single egg. In this way, the whole life cycle and the duration of each larval instar was determined. A detailed morphological study of the four larval instars has been completed and it is important to note the change in the chaetotaxy from one larval instar to the other. This work will be ready soon for publication.

(2) *Artificial Feeding of Mosquitoes*.—This was carried out by means of capillary pipettes filled with human and animal blood. Males and females of *Culex pipiens* were used in this experiment. Mosquitoes of both sexes were enclosed in small square wooden frames covered with mosquito netting. The feeding pipette was introduced through the net, and it was interesting to find out that male mosquitoes could be induced to feed on blood by this method. After further elaboration of this technique, it is hoped that the amount of blood taken by a mosquito in single meal could be determined. Experimental infection of *Anophele*ne mosquitoes with malarial parasites will be carried out, using the artificial feeding method.

(3) *Egyptian Scorpions* :—

The terminal segment of 15,623 scorpions were sent to the Institute from the Public Health Laboratories for identification. These were identified as follows :—

15000 *Buthus quinquestriatus*.

489 *Buthus acutecarinatus*.

113 *Buthus occitanus*.

19 *Buthus australis citrinus*.

2 *Buthus leptochelys*.

These numbers probably indicate their relative incidence in Egypt.

#### EXPERIMENTAL ANIMALS

Annexed to the Institute, there is an Animal House for keeping the Animals necessary for the Experimental work. A special observation book is kept for each group of animals, indicating their numbers and description of the experiments made and results found.

The first division includes 10 monkeys of which six belong to *Macacus* and the other four to *Papio hamadryas*. These are chiefly reserved for experimental infection with *Bilharzia*.

The second division includes dogs, four of which are experimentally infected with *Ancylostoma caninum*, two harbour *Heterophyes* and the rest are mainly reserved for pharmacological purposes. Some of the dogs have been born and brought up on the premises. These are of special value in experimental infections with helminths.

There is a large number of white rats, guinea-pigs, rabbits, kittens and pigeons to serve the different problems of research.

#### PHOTOGRAPHY SECTION

This section is now fully equipped with the necessary articles used in the different processes of micro and ordinary photography, and it is now possible to have good microscopic pictures, prints and lantern slides.

## PART II

# FIELD WORK

## 1.—PARASITOLOGICAL SURVEY OF AN EGYPTIAN VILLAGE

Kafr Ghatati is a small village of 1038 inhabitants, lying near Cairo and 3 kilometres North of the Pyramids of Giza.

This village was selected primarily on account of the prevalence of Elephantiasis in it. The investigations included, in addition, Helminthic and Protozoal infections as well as mass treatment of those infected and sanitating the village by digging pumps at suitable sites to be used as water supply and providing each house with a bore-hole latrine.

The aim was to examine every individual in the village systematically for parasitic infections. A suitable ambulatory laboratory was established just outside the village, using tents. Suckling children were not examined. Otherwise, all inhabitants were examined in the following ways :—

1. A specimen of urine was taken and examined for Schistosoma.
2. A specimen of stools was examined for helminth ova. 100 cases were examined for intestinal protozoa. In some cases, an ova count was made to assess the intensity of infection.
3. A blood film and a thick drop were taken and examined for Malaria from 100 cases.
4. A thick drop was examined at night for Filaria.
5. A clinical examination was made for Filarial manifestations.

A mosquito and a snail survey were made.

The detailed results will be published later.

### *Helminthic Infections:—*

Number of cases whose urine was examined	...	...	...	...	...	...	750
Schistosoma haematobium ova in urine	...	...	...	...	...	...	351
Number of cases whose stools were examined for ova	...	...	...	...	...	...	749
Ancylostoma ova	...	...	...	...	...	...	557
Ascaris ova	...	...	...	...	...	...	582
Hymenolepis	...	...	...	...	...	...	38
Enterobius	...	...	...	...	...	...	105
Trichocephalus trichuris	...	...	...	...	...	...	5
Trichostrongylus	...	...	...	...	...	...	121
Strongyloides stercoralis	...	...	...	...	...	...	1
Free from helminthic ova in urine and stools	...	...	...	...	...	...	42

958 individuals were examined for the presence of microfilaria in the blood. 254 gave a positive result, *i.e.* 26.5 per cent.

The filarial manifestations were as follows :—

The result of examination of 100 cases for intestinal protozoa was as follows:—

Embadomonas intestinalis	...	...	...	...	...	...	...	...	...	...	...	3
Tricercomonas hominis	...	...	...	...	...	...	...	...	...	...	...	2
Negative for protozoa	...	...	...	...	...	...	...	...	...	...	...	20

No cases of Malaria were found on examining 100 cases. One case of Malaria, however, was reported during the campaign.

Mass treatment of helminthic infections was carried out. The drugs used were:—

1. Intramuscular injections of Fouadin for Schistosomiasis.
2. Carbon Tetrachloride for pure Ancylostoma infections.
3. Oil of Chenopodium for pure Ascaris infections.
4. A mixture of Carbon Tetrachloride and Oil of Chenopodium for mixed Ancylostoma and Ascaris infections.

The mosquito survey revealed the presence of the following species:—

1. *Culex pipiens*.
2. *Theobaldia longiareolata*.
3. *Aedes caspius*.
4. *Culex perixiguius*.
5. *Anopheles pharoensis*.

*Culex pipiens* was found to be the carrier of the *Wuchereria bancrofti* in the locality. Mosquitoes of this species were found to be naturally infected. Experimental infection was also successful in 100 per cent of mosquitoes infected. A detailed description of the transmission of Filaria in the area was published. (The Journal of the Egyptian Medical Association, Vol. XV, No. 6).

The snail survey showed the presence of the following species:—

1. *Bulinus dybowskii*.
2. *Bulinus contortus*.
3. *Bulinus innesi*.
4. *Vivipara unicolor*.
5. *Cleopatra bulimoides*.
6. *Cleopatra cyclostomoides*.
7. *Bythinia* sp. ?

## 2.—FILARIASIS IN KOM EL NOUR

During August 1932, the village of Kom el Nour (Mit Ghamr District), Sharqiya Province, was visited. The village is reported to contain Elephantiasis cases. It was considered necessary to verify this and to discover the mosquito intermediate host there.

1000 individuals, living in all parts of the village, were examined for the presence of *Microfilaria bancrofti* in their blood. The specimens were taken from 9 to 12 p.m. 18 per cent were found to have microfilaria in their blood. 67 cases had Elephantiasis, principally in the lower limbs.

A mosquito survey was made. The village is surrounded by many unused wells in which large numbers of mosquito larvae were breeding. These wells were used 10 to 15 years ago for irrigation purposes. They draw their water from the subsoil. Since the improvement of the perennial irrigation in the area, these wells were practically abandoned. The proprietors, however, refuse to fill them in case they need them in years in which the Nile is exceptionally low. The species of mosquitoes found were:—

1. *Culex pipiens*.
2. *Anopheles pharoensis*.
3. *Theobaldia longiareolata*.

Within the village, an abandoned well was found in one of the mosques which teemed with an unbelievable number of *Culex pipiens* larvae. This well is used at present as a cesspit for ablution water.

One specimen of *Culex pipiens*, caught in a house of a Filaria infected family, was found naturally infected with developing Filaria in the thoracic muscles. This proved that *Culex pipiens* is the carrier in this part of the country, confirming the finding of Kafr Ghatati near Cairo.

The Health Authority was notified of the conditions at Kom el Nour and was advised to fill the unused wells and to apply crude oil to the cesspits in the mosques.

### 3.—PRELIMINARY INVESTIGATION OF LEISHMANIASIS AT GEZIRET SEOUD

During 1931, the Medical Officer of Geziret Seoud Village Hospital suffered from sores on the hands which were diagnosed clinically as Oriental sores. In the same Hospital, the Moawin also suffered from similar affections. The case of the Medical Officer was only seen after repeated administration of  $\text{CO}_2$  snow for treatment. No parasites could be demonstrated at that time.

This locality was visited on August 5, 1932 to search for sand flies and cases of Leishmaniasis. 350 inhabitants were examined for sores. Two cases only showed sores that may be due to Leishmaniasis. No parasites were however found microscopically. 70 specimens of sand flies were caught in the Hospital. All of them proved to be *Phlebotomus papatasii*.

The area will be re-investigated during different seasons of the year.

### 4.—A PARASITOLOGICAL MISSION TO THE BAHARIA AND FARAFRA OASES

The members of this mission were : Dr. M. Khalil Bey, Director of the Institute ; Dr. Mostapha Omar Bey, Professor of Clinical Pathology, Faculty of Medicine, Cairo ; Dr. Ali Hassan, Assistant Professor of Physiology, Faculty of Medicine, Cairo ; Dr. Said Abdou ; Dr. Salah el Din Nassif and Dr. Hussein Fouad Nagati.

The trip was started on Monday, 25th January 1932 in four cars of the Frontier Districts Administration. The mission was accompanied by Captain Ahmed Shawky. The route followed was from the Faculty of Medicine to the Pyramids of Giza, then across the desert. At first the direction was North to near Wadi el Natroun, then West and lastly South. The first night was passed in the desert and the mission arrived at Baharia on the second night. The work was begun the following morning by examining the School Children of Bawiet and Qasr. Examination of the adults was carried out in the afternoon.

On the 28th of January 1932, children were also examined and some of the water channels were surveyed. On the 29th, some adults from Mendisha and Zabo were examined in the morning. In the afternoon, the water channels of Bawiet and El Qasr were examined and some mosquitoes were also collected.

On January 30th, the School Children of Mandisha and Zabo were examined.

On the 31st, the mission proceeded to Farafra. The big car broke down on the way. We passed a night in the desert. Three of us proceeded to Farafra with the smaller cars to order some camels. We utilised the opportunity to examine some children and adults of this Oasis.

On the 2nd of February, we returned from Farafra to where we left the rest of the members and passed another night until the camels arrived. We returned to Baharia on the evening of the 3rd of February.

On the 4th of February, the springs of Zabo were examined. On the fifth, the springs of Mandisha were examined. On the 6th, the springs of Bawiet and Qasr were examined, mosquitoes were collected and the diet of the inhabitants was examined. On the 7th, the channel of the biggest spring "Bishmou" was surveyed ; it runs for about three kilometres.

The 8th of February was Bairam Feast, and the custom of visiting the Officials and Notables was followed. On the 9th, we prepared for departure and left the Oasis at 4 a.m. of the 10th and arrived Cairo at midnight of the same day.

On our way back, we met some foreign travellers who lost their way and helped them. We took four of them to Cairo to arrange for a rescue party which was successful.

*A.—HELMINTHIC INFECTIONS AMONGST THE INHABITANTS OF BAHARIA AND FARAFRA OASES.*

	Adults Bawiety and Qasr	Children Bawiety and Qasr	Total Bawiety and Qasr	Adults Mandisha	Children Mandisha	Total Mandisha	Adults Zabo	Children Zabo	Total Zabo	Total Baharia	Children Farafra	Adults Farafra	Total Farafra
Urine Examined ... ... ...	42	37	79	31	35	66	19	11	30	175	26	25	51
<i>Schistosoma haematobium</i> ...	22	24	59	26	28	54	19	11	30	140	—	—	—
<i>Negative</i> ... ... ...	10	13	23	5	7	12	—	—	—	35	26	25	51
Stools Examined ... ... ...	33	32	65	31	35	66	19	11	30	161	26	25	51
<i>An cylostoma</i> ... ... ...	17	15	32	12	12	29	14	4	18	74	—	1	1
<i>Ascaris</i> ... ... ...	1	1	2	—	—	—	—	—	—	2	—	—	—
<i>Hymenolepis</i> ... ... ...	1	7	8	1	4	5	—	3	3	16	3	—	3
<i>Schistosoma haematobium</i> ...	1	—	1	—	—	—	—	1	1	2	3	—	—
<i>Trichocephalus</i> ... ... ...	—	1	1	—	—	—	—	—	—	1	—	—	—
<i>Negative Stools</i> ... ... ...	14	13	27	18	20	38	4	4	8	73	23	24	47
Negative in Urine and Stools...	3	5	8	3	5	8	—	—	—	16	23	24	47

*B.—DISTRIBUTION OF SNAILS IN THE SPRINGS OF BAHARIA AND FARAFRA OASES.*

	Ampullaria ovata	Limnea caillaudi	Bulinus dybowskii	Melania tuberculata
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*Bawiety Village.*

Konia Spring ... ... ...	++	++	++	++
Salat Spring ... ... ...	++	++	++	++
Abu Ghanima Spring ... ... ...	++	++	++	++
Sheikh Saleh Spring ... ... ...	++	++	++	++
Zeaiter Spring ... ... ...	++	++	++	++
Galash Spring ... ... ...	++	++	++	++
Hema Spring ... ... ...	++	++	++	++
Bishmon Spring ... ... ...	++	++	++	++
Hobga Spring ... ... ...	++	++	++	++

*El Qasr.*

Genima Spring ... ... ...	++	++	++	++
Kada Spring ... ... ...	++	++	++	++
Shalabi Spring ... ... ...	++	++	++	++
Khalid Spring (Drinking) ...	++	++	++	++
Sit Spring ... ... ...	++	++	++	++
Ebssa Spring ... ... ...	++	++	++	++
Khabu Spring ... ... ...	++	++	++	++
Obeida Spring ... ... ...	++	++	++	++
Faskieh Spring ... ... ...	++	++	++	++
Mahbas el Housan Spring ...	++	++	++	++
Housan Spring ...	++	++	++	++
Kabira Spring (Drinking) ...	++	++	++	++
Gahanoem Spring ... ... ...	++	++	++	++
Fatim Spring ... ... ...	++	++	++	++
Mohei Shawer Spring ... ... ...	++	++	++	++

*Zabo.*

Talma Spring ... ... ...	++	++	++	++
Tahwil Spring ... ... ...	++	++	++	++
Siwa Spring ... ... ...	++	++	++	++
Kagarin Spring ... ... ...	++	++	++	++
Gaass Spring ... ... ...	++	++	++	++
Moghania Spring ... ... ...	++	++	++	++

	Ampullaria ovata	Limnea caillaudi	Bulinus dybowskii	Melania tuberculata
Sharqîya Spring	...	+	—	—
Gharbîya Spring	...	+	—	—
Said Spring	...	+	—	—
Tofaili Spring	...	—	—	—
Mohabis Spring	...	—	—	—
Habsia Spring	...	+	—	+
Kabu Spring	...	—	—	—
Mohaibis Spring	...	+	—	—
Ghertan Spring	...	+	—	—
Masira Spring	...	—	+	—

*Mandisha.*

Sharqîya Spring	...	...	...	...	...	+	—	—	—	—
Gharbîya Spring	...	...	...	...	...	+	—	—	—	—
Said Spring	...	...	...	...	...	+	—	—	—	—
Tofaili Spring	...	...	...	...	...	—	—	—	—	—
Mohabis Spring	...	...	...	...	...	—	—	—	—	—
Habsia Spring	...	...	...	...	...	+	—	+	+	—
Kabu Spring	...	...	...	...	...	—	—	—	—	—
Mohaibis Spring	...	...	...	...	...	+	—	—	—	—
Ghertan Spring	...	...	...	...	...	+	—	—	—	—
Masira Spring	...	...	...	...	...	—	+	—	—	—

*Farafra Spring*

Only *Ampullaria ovata* was found.

*C.—CONCLUSIONS*

*Schistosoma haematobium* is a common disease in the Baharia Oasis. All the four villages are widely infected. *Bulinus* snails were found in all the villages. The springs used as a source for drinking water are mostly infected. This is probably due to the fact that those springs have the least salt contents, and for the same reason they are favourable for the breeding of *Bulinus* snails.

This Oasis is the only one in Egypt in which *Ancylostomiasis* is endemic. About 44 per cent of the population are infected. This Oasis differs from the other Egyptian Oases in its abundant water supply. The large number of marshes, the intense vegetation, large gardens and deep shade—all these factors combine to offer a suitable nidus for the development of *Ancylostoma* larvae.

*Fascioliasis* in sheep is common in the Oasis, so much so that sheep cannot be reared, and they have to be constantly imported for slaughter. Apparently goats are more resistant to the infection, and so there is a fair number of them. The only limnea found is *Limnea caillaudi* which has been suspected from epidemiological grounds to be the intermediate host in Dakhla Oasis also.

It is hoped that in future it will be possible to undertake the control of *Schistosomiasis* in this Oasis.

**5.—PARASITOLOGICAL EXAMINATION OF LABOURERS OF THE COTTON WEAVING AND SPINNING COMPANY IN MEHALLA EL KOBRA**

In the summer of this year, the Institute has carried out the examination and treatment of the labourers of the Cotton Weaving and Spinning Company in Mehalla el Kobra. The purpose of this work was to find out the effect of the parasitic infection on the output of the individuals. The mass of the labourers comes from the surrounding area of the Delta, a locality rife with urinary and intestinal Bilharziasis, *Ancylostomiasis*, *Ascariasis* and Egyptian Splanomegaly. In all, 2045 individuals were examined with the following results :—

			%
Urine	...	<i>Schistosoma haematobium</i> ...	47.7
	...	<i>Schistosoma mansoni</i> ...	1.8
Stools	...	<i>Schistosoma mansoni</i> ...	26.9
	...	<i>Schistosoma haematobium</i> ...	1.2

	%
Total Bilharzia Infection ... ... ... ... ... ... ...	58.8
Ancylostoma duodenale ... ... ... ... ... ... ...	24.9
Ascaris lumbricoides ... ... ... ... ... ... ...	44.2
Trichostrongylus Sp. ... ... ... ... ... ... ...	28.5
Entrobius vermicularis ... ... ... ... ... ... ...	7.2
Hymenolepis nana ... ... ... ... ... ... ...	3.6
Trichocephalus trichuris ... ... ... ... ... ... ...	3.4
Strongyloides stercoralis ... ... ... ... ... ... ...	1 case
Total cases free from parasites ... ... ... ... ... ...	18.8
Total cases infected with parasites ... ... ... ...	81.2

The labourers infected with Bilharzia were treated with Fouadin injections. Ancylostoma cases were treated with 5 c.c. of Carbon tetrachloride as an adult dose, followed one hour later by a saline purge. Ascaris infections were treated with 2.5 c.c. of oil of Chenopodium for adults together with 40 c.c. of castor oil. Cases of mixed infection with Ascaris and Ancylostoma were given a mixture of 3 c.c. of Carbon tetrachloride and 2 c.c. of oil of Chenopodium.

(For details, see the Journal of the Egyptian Medical Association, Vol. XVI, 1932).

## PART III. CLINICAL REPORT

## 1.—THE RESULT OF THE WORK OF THE OUTPATIENT CLINIC

(a) *Admission of Cases.*

The Outpatient Clinic is intended mainly for the treatment of Helminthic infections. All individuals that present themselves are asked as a routine to submit a specimen of urine and another of faeces for microscopic examination. Cases that are found free from Helminthic infections are rejected and advised to seek the services of the neighbouring Qasr el Aini Hospital where all diseases are dealt with. About 32 per cent of the new patients are found free from Helminthic Infections.

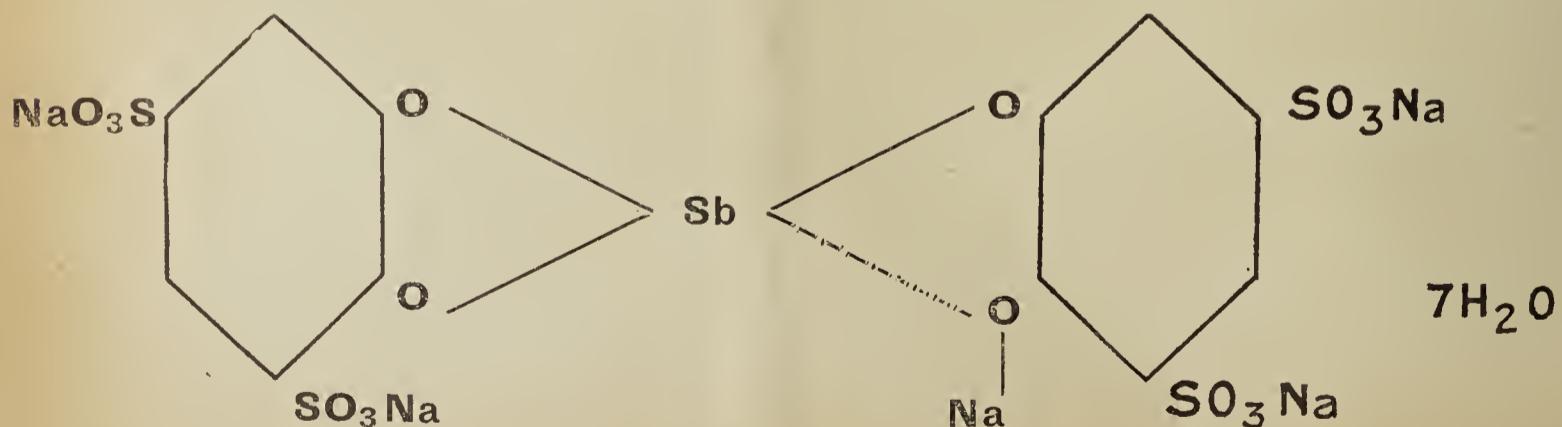
The number of patients applying daily for examination and treatment is far beyond the capacity of the staff to deal with properly. The admission of new cases daily is limited to 45. These are accepted according to their priority in presenting themselves at the Hospital gate in the morning. Those applying later, which are sometimes 100 or more, are referred to the Ancylostoma and Bilharzia tent Hospital which lies within five minutes walk or are advised to come early on another day.

(b) *Incidence of Parasitic Infections.*

The total number of new cases dealt with during the year 1932 was 10,887 cases. The microscopical examinations of their urines and stools revealed the following:—

(c) *Schistosomiasis Treatment.*

Fouadin was the drug used for the routine treatment of Schistosomiasis. Fouadin is a 6.3 per cent solution of a complex organic antimony compound expressed as antimony (III) Pyrecatechin bisulphonate of sodium.



The course of treatment laid down as a result of detailed investigations is as follows:—

1st day : ... ... ... ... 3·5 c.c.	2nd day ... ... ... ... 5·0 c.c.
3rd day ... ... ... ... 5·0 c.c.	5th day ... ... ... ... 5·0 c.c.
7th day ... ... ... ... 5·0 c.c.	9th day ... ... ... ... 5·0 c.c.
11th day ... ... ... ... 5·0 c.c.	13th day ... ... ... ... 5·0 c.c.
15th day ... ... ... ... 5·0 c.c.	
Total amount for the course	... ... ... ... ... ... ... ... ... 43·5 c.c.

In case of children or adults of less than 60 kilograms in weight, the dose is given in proportion to their weight.

Microscopic examination of the excreta is made after the 9th injection, and if necessary more injections are given. Re-examination is repeated after every two additional injections.

Out of a total of 5,253 cases infected with *Schistosoma*, 621 did not receive any treatment at all, owing principally to their absenting themselves. 2,353 cases did not complete the course of 9 injections. This is practically 50 per cent of the total number of cases. The patients will stop the treatment apparently for the slightest reason arising in their private affairs. The treatment being free, they can resume it at any future occasion. In this way, a great loss of time and expense occurs. It is difficult to remedy this unless the patients are made to pay a small fee before the treatment is begun. Such a system is followed by the Christian Missionary Hospital with apparent success.

The immediate result of Fouadin treatment was :—

Number of cases who completed the course of 9 injections	...	...	2,279
Number of cases who were cured	...	...	1,980 (86.8%)
Number of cases cured after 9 injections	...	...	1,417 (62.2%)
Number of cases cured after 11 injections	...	...	469 (20.5%)
Number of cases cured after 13 injections	...	...	94 (4.1%)
Number of cases who did not continue the additional injections			288 (12.6%)
Number of cases still positive after 13 injections	...	...	4

Re-examination one month after the end of treatment was possible in 322 cases. The result was that 292 were cured and 30 cases relapsed, i.e. 90.7 per cent were cured.

Re-examination three months after the end of treatment was possible in 40 cases, all of them were found to be cured.

It was observed that Schistosomiasis of the urinary tract is more susceptible to treatment than Intestinal infection.

(d) *Symptoms developing during the Treatment.*

Amongst 4,632 cases who received Fouadin injections, the following symptoms were reported :—

(1) Vomiting occurred to 49 cases (about 1%). This symptom was frequent during later injections.

(2) Giddiness occurred to 41 cases (less than 1%). It was more frequent after the 5th injection.

(3) Fainting occurred to two patients after the 1st injection. Both recovered very soon.

(4) Rise of temperature occurred in 13 cases. In some of them, it may be due to intercurrent disease. All cases recovered.

(5) Skin rashes : 4 cases developed Pyodermia. 1 case had itching, 2 cases developed Urticaria. Herpes Zoster developed in 2 cases.

(6) Tachycardia was observed in two cases.

Inflammation of buttock as a result of the treatment developed in two cases. One case was relieved by hot fomentation. The other developed an abscess which was opened.

(e) *The Incidence of the Lesions of the two Species of Schistosoma in the Urinary and Intestinal Tracts.*

The subject of infection of the Intestinal tract with *Schistosoma haematobium* and the infection of the Urinary tract with *Schistosoma mansoni* has been discussed by many

observers and caused polemics. Amongst the 5263 cases infected with Schistosomiasis of both the urinary and intestinal tracts, the following was observed :—

Total number of Schistosomiasis cases ...	...	...	...	...	...	...	...	...	...	...	6,045
Schistosoma haematobium ova in urine only; stools free	...	...	...	...	...	...	...	...	...	...	5,124
Schistosoma haematobium ova in urine and stools	...	...	...	...	...	...	...	...	...	...	65
Schistosoma haematobium ova in urine and Schistosoma mansoni ova in stools	...	...	...	...	...	...	...	...	...	...	85
Schistosoma haematobium and Schistosoma mansoni ova in both urine and stools	...	...	...	...	...	...	...	...	...	...	1
Schistosoma mansoni ova in stools only	...	...	...	...	...	...	...	...	...	...	64
Schistosoma mansoni ova in urine and stools	...	...	...	...	...	...	...	...	...	...	1
Schistosoma haematobium ova in stools only	...	...	...	...	...	...	...	...	...	...	12
Schistosoma haematobium ova in urine and stools with Schistosoma mansoni ova in stools	...	...	...	...	...	...	...	...	...	...	2
Schistosoma haematobium and Schistosoma mansoni ova in urine only; stools free	...	...	...	...	...	...	...	...	...	...	32
Schistosoma mansoni in urine and stools and Schistosoma haematobium in urine	...	...	...	...	...	...	...	...	...	...	2

(f) *Treatment of Ancylostomiasis.*

Carbon tetrachloride was used in the treatment of pure *Ancylostoma* infection. The purity of the drug was ascertained in addition to the ordinary chemical tests by a biological test. The first portion distilling over when about two litres of the drug are heated gently on an electric heater amounting to 1 per cent of the total volume was administered to a dog. If the animal showed any serious symptoms or died, the whole consignment of the drug was treated in the same way and the first 1 per cent distilling over was discarded. In this way, the number of cases showing symptoms within a short time after administration, was greatly minimised.

5 c.c. is the adult dose given with about 30 c.c. of water. This is followed in two hours by a saline purge. If the purge does not act within two hours, an enema is administered. Adults of less than 60 kilograms in weight and children are given a dose proportionate to their weight. Re-examination is made after one week when any *Ancylostoma* worms remaining in the intestine will be laying ova in a normal way recovering from the effect of the anthelmintic.

Patients suffering from both Schistosomiasis and Ancylostomiasis are treated with Carbon tetrachloride before they are submitted to the Fouadin treatment.

Patients harbouring both *Ancylostoma* and *Ascaris* are given a mixture of Carbon tetrachloride 2.25 c.c. and Oleum Chenopodium 2.25 c.c.

More than 1,000 cases were given Carbon tetrachloride but did not present themselves for examination after one week.

Out of the 1255 cases who were re-examined after the first treatment, 50 per cent were cured.

Out of the 116 cases who received two treatments and were re-examined, 70.8 per cent were cured.

Out of the 40 cases who received three treatments and were re-examined, 72.5 per cent were cured.

Out of the 11 cases who received four treatments and were re-examined, 9 cases were cured, i.e. 82.2 per cent.

(g) *Remote results of the Treatment.*

145 cases presented themselves for re-examination one month after their treatment. 118 cases were found to be still negative, i.e. 81.4 per cent.

7 cases presented themselves for re-examination three months after their treatment and all of them were free from *Ancylostoma* infection.

(h) *Symptoms appearing after Treatment.*

Giddiness was reported in 16 cases. This was always relieved by a soap enema. No cases of intoxication were reported in this series.

(i) *Treatment with a mixture of Carbon Tetrachloride and Oil of Chenopodium.*

Equal parts of Oil of Chenopodium and Carbon tetrachloride were mixed together. The dose given was 4.5 c.c. to an adult. The after treatment was the same as described under Carbon tetrachloride. This treatment is efficacious against pure ancylostoma infection, but is especially indicated in cases where there is both Ancylostoma and Ascaris Infection.

16 cases of pure Ancylostoma infection were treated with the mixture. 9 of them were cured after one dose. No symptoms appeared.

Of 195 cases of mixed Ancylostoma and Ascaris infections, 115 were found on re-examination to be free from both parasites, i.e. 59 per cent, while 69 were cured from Ascaris but were still passing Ancylostoma ova, i.e. 34 per cent. Only two cases in this series were cured from Ancylostoma while they still harboured Ascaris, and 9 cases were still harbouring both after the first dose of the mixture.

This mixture frees in one dose 60 per cent of the Ancylostoma cases and 94.3 per cent of the Ascaris cases. These doses may be considered as fairly high, but no symptoms were observed after their administration.

(j) *Ascaridol.*

Ascaridol was administered in doses of 1.5 c.c. to 174 cases of Ascaris infection. 97 per cent were cured after one treatment, and all were cured after a second dose.

(k) *Enterobius vermicularis.*

Carbon tetrachloride was found efficacious in expelling large numbers of Enterobius worms. It is not yet certain if it cures the cases as the presence of ova in the stools is extremely unreliable.

(l) *Taenia saginata.*

Amongst the 10887 cases examined, 82 were found infected with *Taenia saginata*. Of these, 18 did not present themselves for treatment. The rest were treated with Felix mas extract. The results were unreliable when different brands are used. Ultimately, a fresh extract was prepared in the Laboratory from Male fern collected fresh and despatched by post from Switzerland. In the British Pharmacopaeia of 1932, the extract is standardised using olive oil as vehicle. When this was followed, serious symptoms of collapse were noticed. The oil apparently increases the toxicity by helping the absorption of the drug and should be avoided.

Of the 64 cases treated, 23 (i.e. 35.9 per cent) passed the worm with the head after one dose and one case passed the head after the second dose. The rest of the cases did not present themselves for further treatment. The maximum dose used was 6. c.c.

(m) *Other Helminth Infections.*

The following Helminth infections were treated when they were accompanied with Ancylostoma or Ascaris infections and the results were observed:—

	Carbon tetrachloride		Oil Chenopodium		Ascaridol		Mixture of Chenopodium and Carbon Tetrachloride	
	No.	Cured	No.	Cured	No.	Cured	No.	Cured
		%		%		%		%
Trichocephalus trichuris	14	64	4	50	2	50	3	66
Hymenolepis nana ...	35	65	10	50	8	25	12	58
Strongyloides stercoralis	3	66	—	—	—	—	—	—
Trichostrongylus Sp. ...	152	72.4	33	52	31	64.5	55	72.7

(n) *Statistics of the Work done in the Hospital.*

TABLE I.—NUMBER OF NEW PATIENTS DURING 1932 PER MONTH.

Month		Females under 12 years	Females over 12 years	Males under 12 years	Males over 12 years	Total
January	...	33	175	61	383	652
February	...	41	147	64	304	556
March	...	78	238	61	405	782
April	...	35	182	56	335	608
May	...	44	223	68	443	778
June	...	67	286	130	671	1,154
July	...	100	285	178	573	1,136
August	...	91	342	110	551	1,094
September	...	62	245	71	453	831
October	...	78	366	87	642	1,173
November	...	80	324	102	640	1,146
December	...	73	266	89	549	977
	TOTAL ...	782	3,079	1,077	5,949	10,887

TABLE II.—EXAMINATION OF URINE OF NEW CASES PER MONTH.

Month	Number examined	Positive for Bilharzia
January ...	649	339
February	553	315
March	778	360
April	607	328
May...	774	384
June	1,149	638
July...	1,136	597
August	1,091	513
September	829	345
October ...	1,167	517
November	1,136	525
December	974	450
<b>TOTAL</b>	<b>10,843</b>	<b>5,311</b>

TABLE III.—EXAMINATION OF STOOLS OF NEW PATIENTS PER MONTH.

Month	Number examined	Pos. for Bilharzia		Pos. for Aneylostoma	Pos. for Ascaris	Pos. for other Parasites	Neg. for all Parasites
		Mansoni	Haemato-bium				
January ...	632	16	6	191	69	179	131
February	548	18	7	125	52	130	160
Mrach	753	14	14	185	70	201	135
April	590	8	6	172	67	142	298
May	753	6	8	185	75	145	418
June	1114	25	5	331	110	273	566
July	1,098	18	3	329	124	251	553
August	1,061	20	8	248	103	229	600
September	815	15	5	196	100	134	487
October	1,144	25	11	313	123	269	631
November	1,094	12	8	276	90	198	599
December	937	15	4	208	123	190	507
TOTAL	10,539	92	85	2,759	1,106	2,341	5,085

TABLE IV.—NEW CASES NEGATIVE FOR  
BILHARZIA IN URINE AND STOOLS PER MONTH.

Month	Number
January ...	130
February ...	84
March ...	143
April ...	261
May ...	388
June ...	507
July ...	533
August ...	573
September ...	481
October ...	654
November ...	581
December ...	507
TOTAL ...	4,842

TABLE V.—NUMBER OF NEW CASES FREE  
FROM ALL PARASITES PER MONTH.

Month	Number
January ...	164
February ...	148
March ...	238
April ...	152
May ...	254
June ...	276
July ...	295
August ...	333
September ...	315
October ...	371
November ...	364
December ...	303
TOTAL ...	3,213

TABLE VI.—NUMBER OF TREATMENTS ADMINISTERED

Month	Fouadin Injections for Bilharzia			Doses of Carbon tetrachloride for Ancylostoma and Oxyuris			Doses of Oil of Chenopodium or Ascaridol for Ascaris		
	New Cases	Old Cases	Total	New Cases	Old Cases	Total	New Cases	Old Cases	Total
January ...	278	2,218	2,496	157	87	244	23	2	25
February	236	1,377	1,613	116	21	137	19	—	19
March	286	2,442	2,728	178	53	231	19	5	24
April	234	1,587	1,821	142	44	186	30	3	33
May	317	2,360	2,677	171	57	228	34	1	35
June	475	3,144	3,619	273	64	337	55	1	56
July	526	3,568	4,094	280	96	376	50	1	51
August	431	3,442	3,873	254	97	351	63	4	67
September	273	2,084	2,357	139	54	193	37	4	41
October	412	2,686	3,098	249	69	318	28	1	29
November	412	2,683	3,095	199	63	262	40	5	45
December	358	2,530	2,888	144	57	201	48	3	51
<b>TOTAL</b>	<b>4,238</b>	<b>10,121</b>	<b>34,359</b>	<b>2,302</b>	<b>762</b>	<b>3,064</b>	<b>446</b>	<b>30</b>	<b>476</b>

This table is a compilation of the monthly returns of the Out-Patients Department. For this reason the numbers under result of treatment will embody repetition as cases counted as not cured in one month's report will be carried in the following month.

DURING 1932 PER MONTH.

Doses of Mixture of Carbon tetrachloride and Oil of Chenopodium for Ancylostoma and Ascaris				Doses of Felix mas for Taenia saginata				Emetine Injections for Amœbic Dysentery				Injections for Cystitis Post-Bilharzial			
New Cases	Old Cases	Total		New Cases	Old Cases	Total		New Cases	Old Cases	Total		New Cases	Old Cases	Total	
28	—	28	5	—	1	—	6	—	—	—	—	—	—	—	—
8	—	8	4	—	—	—	4	—	—	—	—	—	—	—	—
19	—	19	4	—	2	—	6	—	—	—	—	—	—	—	—
16	—	16	4	—	—	—	4	—	—	—	—	—	—	—	—
29	—	29	—	1	—	—	1	—	—	—	—	—	—	—	—
37	—	37	6	1	—	—	7	3	23	—	26	—	—	—	—
30	—	30	11	1	—	—	12	1	9	—	10	—	—	—	—
32	—	32	4	—	—	—	4	5	30	—	35	—	—	—	—
44	—	44	—	—	—	—	—	—	—	—	—	—	—	—	—
56	—	56	8	2	—	—	10	1	5	—	6	11	14	—	25
57	3	60	5	—	—	—	5	—	—	—	—	1	54	—	55
51	1	52	9	2	—	—	11	—	—	—	—	1	7	—	8
407	4	411	60	10	—	—	70	10	67	—	77	13	75	—	88

TABLE VII.—RESULTS OF MICROSCOPIC EXAMINATION AFTER TREATMENT.

Month	Bilharzia						Ancylostoma					
	Negative			Positive			Negative			Positive		
	Number Examined	After 9 injections	After 11 injections	After 9 injections	After 11 injections	After 11 injections	Number examined	After more than 11 injections	—	Number examined	After more than 11 injections	—
January	303	167	49	6	67	12	226	2	—	128	98	23
February	118	36	18	5	52	7	91	—	—	68	68	23
March	298	104	43	16	96	33	164	7	—	72	92	22
April	175	68	32	13	47	10	129	5	—	82	47	22
May	256	102	34	7	61	20	166	2	—	100	66	22
June	329	137	56	16	102	17	195	1	—	107	88	22
July	362	185	59	9	87	19	281	3	—	171	110	22
August	392	194	67	7	107	16	1	—	—	283	175	108
September	291	146	43	9	69	22	2	—	—	172	105	67
October	269	132	41	6	81	7	2	—	—	196	102	94
November	260	118	46	7	76	9	4	—	—	187	102	85
December	265	144	40	4	67	9	1	—	—	163	82	81
Total	3,318	1,533	528	105	941	181	30	2,253	—	—	1,294	959

TABLE VIII.—INPATIENTS TREATED DURING 1932.

Month	Admissions	Discharges	Number of Diets Issued
January ...	—	—	—
February ...	18	10	119
March ...	26	27	210
April ...	15	13	151
May ...	12	10	266
June ...	18	14	397
July ...	13	20	335
August ...	14	9	352
September ...	15	13	404
October ...	23	21	464
November ...	26	24	516
December ...	22	20	557
TOTAL ...	202	181	3,771

N.B.—Inpatients wards were opened on February 15, 1932.

## 2.—CLINICAL REPORT ON THE HOSPITAL INPATIENTS

Patients are admitted to the Hospital wards for one or more of the following reasons :—

1. Cases unfit for outpatient treatment.
2. Cases that develop symptoms during outpatient treatment and need further observation.
3. Cases for study of some problems needing investigation, special treatment or prolonged observation.

All patients admitted are submitted to the following examinations :—

1. Urine and faeces examination for parasites with egg-count when positive.
2. Blood examination for parasites.
3. Haematological pictures.

4. Clinical examination with records on a special observation sheet, containing the important data related to endemic diseases.

5. Special examination according to the case, *e.g.* sigmoidoscopy, cystoscopy, fractional test-meals, liver function tests, blood chemistry, X-rays, electrocardiography, etc.

These methods of investigation and the purpose of their application will be better understood from the following classification of cases into disease-groups :

### (a) *Helminthic Anaemias* .

Cases of helminthic infections, single and multiple associated with anaemia, are admitted to the Hospital and studied for the purpose of :—

1. Elucidating the rôle of each parasite in the production of anaemia. For this reason, haematological studies are done in pure single infections.

2. The haematological position of this anaemia. For this purpose, the following blood examinations are made :—

- (a) Haematological estimations (Sahli).
- (b) Red blood count, morphology and diameter (Halometer).
- (c) Reticulocytic count (by supravital staining of blood film).

- (d) White blood count, total and differential, with determination of Schilling's index.
- (e) Corpuscular volume (Haematocrit method).
- (f) Icterus index.
- (g) Coagulation time, bleeding time and platelet count in some cases.

3. The mechanism and factors responsible for their production. For this reason, study of gastric secretion, degree of intestinal bleeding, etc. are carried out.

4. Their respond to various kinds of treatment. Various haematenics are used and the blood response is measured by estimating the haemoglobin, number of red cells and reticulocytes at intervals.

Of this group, 58 cases are admitted and studied up till now. *Ancylostoma* and intestinal *Schistosomiasis* were found to be the common cause of helminthic anaemia. For this reason, pure *Ancylostoma* cases with anaemia were chosen, other infections being excluded, and submitted to an exhaustive haematological and biochemical study of the blood, gastric secretion to see the rôle of achlorhydria, the rôle of intestinal haemorrhage, etc. After removing the parasites, these cases are submitted to various methods of treatment until the maximum result of blood improvement is reached, and again all these investigations are repeated. Ten cases of pure *Ancylostoma*-anaemia are till now studied.

The anaemia is usually of the hypochromic micro or normo-cytic variety. The haemoglobin reduction is very marked, while the number of red cells is moderately diminished. The colour index is always markedly below one.

Low colour and low reticulocytic count are fairly constant, suggesting absence of haemolysis as a factor in the production of the anaemia. The low reticulocytic count also suggests depression of bone marrow activity, whether this is due to a toxin, repeated bleeding from intestine or difficult absorption of an important substance, is still under investigation.

The biochemical examination of the blood in these cases shows the following variations :—

- (a) Low values of iron contents of whole blood corresponding to the degree of hypochromia is always constant.
- (b) Low cholesterol content is nearly constant.
- (c) Calcium content either low or normal.
- (d) Chloride content of whole blood usually increased.
- (e) Total proteins show slight increase in some cases with disturbed albumin-globulin ratio.

Estimation of gastric secretions by oat fractional test-meal and hystamine in these cases show variable results, the interpretation of which will be discussed when sufficient data are available.

Occult blood is looked for in these cases after three days meat free diet and is found to be invariably present, Charcot-Leyden crystals were found in the stools in four cases of pure *Ancylostoma* infection, where amoebic infection was excluded, suggesting relation to intestinal bleeding rather than to specific amoebic infection.

For experimental productions of these anaemias, see report on experimental and clinical Pathology.

(b) *Hepato-splenomegaly*.

This group of cases is studied in both out-patients and in-patients from the following points of view :—

1. To establish criteria for diagnosis of endemic (Egyptian) hepato-splenomegaly. For this reason, the following investigations are done to all inpatient cases and doubtful outpatients :—

- (a) Clinical examination as regards size of spleen, nature of enlargement, size and consistency of liver, presence of enlarged glands, etc.
- (b) Wassermann reaction.
- (c) Malarial parasites are looked for in films and thick drops and in doubtful cases provocation is done.
- (d) In cases with temperature Widal and blood culture are asked for.

(e) Complete blood picture in order to :—

- (1) Exclude blood diseases as a cause of the splenomegaly.
- (2) Study the type of anaemia associated with this condition.
- (3) Study the existence and nature of the leucopaenia described in this condition.

2. Association with *Schistosomiasis* : Twenty cases were studied in the inpatients, with the following results :—

(a) Intestinal Schistosomiasis	...	...	Sch. m. ...	...	{	Alone	...	...	14
						With urinary	...	...	1
(b) Urinary Schistosomiasis	...	...	Sch. h. ...	...	{	...	...	...	1
						...	...	...	1
(c) No Schistosomiasis	...	...	...	...	{	Congenital syphilis	...	...	1
						Enteric fever	...	...	1
						TOTAL	...	...	20

Intestinal Schistosomiasis has been repeatedly looked for in two cases of typical endemic hepatosplenomegaly using swab, provocation and sigmoidoscope with negative results. The cutaneous reaction was positive but this did not help as both cases had urinary Schistosomiasis. These examinations do not exclude an old healed high intestinal lesion, especially as these cases gave a history of previous anti-bilharzial treatment. This point is to be emphasised and asked for before deciding the non-existence of intestinal Schistosomiasis in any given case of typical endemic splenomegaly.

### 3.—*Effect of anti-bilharzial Treatment* :—

Four cases have frequently reported themselves after Fouadin treatment for a period of two to five months ; the size of the spleen was unchanged in all cases and the liver was diminished in size in two cases. This is probably due to relief of congestion and irritation previously produced by worms, living eggs and possibly toxins, more than to contracting fibrous tissue. There was no sign of progressing cirrhosis as the liver was as smooth and soft as before and no signs of collateral circulation were evident.

### (c) *Malaria*.

Cases admitted were either detected amongst hospital outpatients or sent from Khanka Malaria Research Station for the purpose of therapeutic trial of the new drug "Atebrine."

Five benign tertian and three malignant cases received Atebrine treatment. One tablet (0.1 grm.) three times a day for five days was given and the following observations were made :—

### 1.—*Rate of disappearance of various forms of parasites*.

For this purpose, blood films and thick drops were taken and examined at frequent intervals. All forms of the benign tertian parasites disappeared with the same rate after about the sixth to the eighth tablet from the peripheral blood. The rings of the subtertian parasite disappeared quickly from the peripheral blood after the fifth to the seventh tablet, while crescents remain. Their number does not show increase as seen with quinine treatment (suggesting splenic contraction). Therefore, it was found necessary to follow the Atebrine course in the subtertian cases with 0.01 T.D.S. Plasmochine, under which treatment, crescents disappear and patients were free from all parasites (even after provocation) at the end of five days Plasmochine treatment.

### 2.—*Effect on Rigors*.

Not more than one rigor occurred after the commencement of the treatment and usually milder than the previous ones ; the temperature remaining normal all through afterwards.

### 3. *Effect on the Spleen.*

The size of the spleen was diminished at the end of treatment in two malignant and one benign cases where it was found to be enlarged before treatment. In another case of Egyptian Splenomegaly associated with malignant Malaria, the pathological spleen was not affected by the anti-malarial treatment. The effect of Atebrine on the size of enlarged nonmalarial spleens is now under investigation.

### 4. *Effect on the Liver.*

Atebrine is an acridine derivative allied to Trypaflavine, etc., drugs which are known to have some deleterious effect on the liver cells. The liver in Malaria cases is already strained by haemolysed red cells, malarial pigment, etc., It was intended to study the function of this organ before and at the end of Atebrine treatment. For this purpose, galactose tolerance was studied by estimating the blood sugar curve and the urine after administration of 40 grms. galactose. Up to the present time, only two cases of malignant malaria were studied from this point of view, slight derangement of glycogenic function was noticed at the end of treatment. In addition, the icterus index and urobilinogen were estimated before and after Atebrine treatment ; but these cannot be taken in consideration in this connection in the presence of the malarial haemolytic process. Although a faint yellowish colouration of face is noticed after atebrine treatment, it was found both in patients and in vitro experiments that Atebrine did not by its colour increase the degree of icterus index.

### 5. *Haematological study of cases before and after Atebrine treatment.*

This was made and the following variations were noticed :—

- (a) Reticulocytes increase with the disappearance of the malarial parasites, suggesting a recoverable activity on the part of the bone marrow without any haematinic stimulation.
- (b) There is a tendency to leucopaenia with polymorphocytosis in some cases.

Cases of Malaria treated in this way were considered cured ;

- (1) If they remained parasite free a week after end of treatment in hospital.
- (2) If their temperature remained normal during this time of observation.
- (3) If after provocation no parasites were seen in blood or a rise of temperature was observed.

Then these cases were discharged as cured and were asked to report themselves at intervals.

### 6. *Relapse.*

Up to the present time, six cases have reported themselves after treatment. The longest period was five months. No relapse has set in or residual parasites were observed in their blood even after provocation.

#### (d) *Pellagra.*

Six cases of Pellagra were studied in the inpatients for the following points :—

##### 1.—*Incidence of Achylia Gastrica.*

Fractional test meals and histamine respond of gastric secretions have shown that five cases out of six are achlorhydric unaffected by histamine ; four of these were associated with absence of pepsin (*i.e.* Achylia gastrica).

Two of these achyllic cases were submitted to repeated stomach washes daily for periods of one and half and two months. and the gastric secretions showed no appearance of HCL. or pepsin at the end of these periods, suggesting atrophic conditions of gastric glands rather than recoverable gastritis as a factor in the production of this condition.

Repeated fractional test meals and histamine tests during and at the end of treatment when all other manifestations of Pellagra were cured, showed that this pellagrous achylia gastrica is not affected by treatment.

## 2.—*Incidence of nervous Complications.*

Examination of the nervous system in these cases showed the following:—

Two cases showed pure lateral sclerosis without implication of the posterior columns. One case showed sub-acute combined degeneration of cord.

One case showed generalised rigidity of all limbs and neck of pyramidal character without any signs of pyramidal lesion. This patient showed as well pellagrous dementia:

One case of latent pellagra showed diabetes insipidus. This condition has been repeatedly looked for in every case of pellagra admitted to the hospital since the publication of Rassulev on the frequency of diabetes insipidus in pellagra. This case showed abnormal exaggeration of abdominal reflexes with diminution of knee jerks, but no other abnormal neurological sign or evidence of specific disease in blood or cerebro-spinal fluid. Sella Turcica was found to be normal, fundae were normal and no respond of the condition to the anti-bilharzial and Marmite treatment was observed.

## 3.—*Haematological studies.*

These were done in all cases according to the technique described under helminthic anaemias. All cases showed only moderate degree of anaemia with little reduction in red cell count except one case which showed marked reduction of haemoglobin (30%) in which severe intestinal Bilharziasis was present. The anaemia is of the hypochromic normocytic variety (no macrocytosis was found in any of the five cases associated with achylia gastrica). Leucocytosis is common to all cases except in one where splenomegaly of the endemic character was present and in which leucopenia was found.

## 4.—*Association with parasites.*

All cases were associated with intestinal worms or intestinal Bilharziasis. That this association may at least partly be a predisposing factor in the production of pellagrous manifestations, is suggested by demonstrating in these cases deficient absorption from the intestines, the administration of galactose in three cases was followed by delayed absorption shown by the blood sugar curve.

## 5.—*Treatment.*

Various methods of treatment were tried and their effect on the disappearance of the manifestation of pellagra were observed:—

(a) Removal of parasites and full hospital diet only caused in two cases disappearance of the skin manifestations.

In this connection, an important observation was seen in cases treated for Bilharziasis by Tartar emetic where an erythematous reaction in the skin areas affected developed during the course of treatment. In four cases, this was associated with pain and swelling reaching actual oedema in one case. The administration of Marmite in one case and liver extract in another with continuation of the Tartar emetic course did not affect this condition. The condition improved after the Tartar emetic was stopped. A milder form of this condition was noticed in one case treated by Fouadin. It is difficult to attribute this condition to antimony as it is not excreted through the skin, although it is possible that an allergic state is created by this treatment to which only the affected skin responded.

(b) The administration of HCl. in achylic cases helped the improvement of the condition of the patient.

(c) Liver injection in the form of Campolon daily for ten days did not affect the manifestation in two cases.

(d) Marmite in doses of three tea-spoonfuls daily in sandwich or milk was found to be the most successful in producing marked and rapid disappearance of the pellagrous manifestations, especially the cutaneous. The interruption of Marmite administration was followed in two cases by recurrence of the skin rash, suggesting the potency of the treatment.

These investigations will be extended and biochemical studies added until sufficient data are available for publication.

(e) *Filariasis* :—

Eight cases of this condition were studied and investigated ; the various manifestations seen in these are shown in the following table.

	Number	Microfilaria
Chyluria	4	2
Lymphadenitis	1	1
No pathological manifestation	3	2

The localities from which these cases are derived correspond with our knowledge of the epidemiology of the disease in Egypt.

Kafr Ghatati	2	Minya el Kamh	2
Giza	1	Railway employé	1

Diagnosis of these cases was based on the presence of the microfilaria in blood taken at 1 a.m. In the Railway employé case, microfilaria bancrofti was found at first at 10 a.m. and 12 noon, and when he was admitted to hospital for a few days, microfilaria was found only in the evening and none was found during the day time. This case illustrates perverted periodicity as this patient was on night duty in his work and he used to sleep during the day.

The absence of microfilaria in the blood of two cases of chyluria did not exclude their filarial origin, especially as other possible causations were excluded.

The important points that were especially investigated and found out in such cases are considered in the following :—

(1) History of previous treatment with Tartar emetic ; Fouadin; N.A.B., was obtained in five cases, three of which were positive for microfilaria when they came to the hospital. The other two had chyluria which was not probably filarial in origin.

(2) *Incidence of Bacterial Infection* :—

Catheter specimens of four cases of chyluria were negative for bacteria ; a gland puncture from a case of filarial lymphadenitis and myositis was also sterile for bacteria.

(3) Cases of chyluria were investigated on the following lines to show their true nature :—

- (a) Urine examined microscopically and chemically (osmic acid) for fat.
- (b) Effect of fatty and fat free diet was observed on the chyluric urine.
- (c) Sudan III test was utilised to demonstrate the existence of anastomosis, between the intestinal and the urinary lymphatics. 0.1 grm. of Sudan III in butter was given as sandwich to a fainting patient, the first thing in the morning, urine before and hourly after, for four hours, is collected. In positive cases, the dye appears in the urine in these specimens, while it does not show at all in the urines of pseudochyluria where no such anastomosis exists.
- (d) Various therapeutic measures were tried in cases of chyluria with no permanent improvement ; temporary alleviation of the condition occurs every now and then, but the follow up of the cases showed relapse of the condition on going back to work and normal diet. The measures tried were :—
  - (i) Flat position with elevation of foot of bed combined with fat free diet and alkalanisation of urine ; the last procedure was found to produce finer emulsion of the fat in the urine with relief of loin pains and retention of urine ; these being due to big clots of fat.
  - (ii) Trypaflavine intravenously every other day was tried in some cases with no effect on the number of microfilaria in the blood or on the condition of the urine.
  - (iii) Spirocid, an organic arsenical compound to which recently anthelmintic properties have been attributed—courses of four days with intervals of rest were given with no effect.

(f) *Amoebic Dysentery* :

Cases of this group are submitted to the following investigations :—

- (1) Examination of stools for vegetative amoeba and cysts.
- (2) Sigmoidoscopic examination for demonstration of lesions and their extent ; scrapings from the ulcers through the sigmoidoscope are examined microscopically for confirmation.

Twenty cases from the outpatients, were treated by Emetine injections with the following results :—

Number of patients having a course of 6 injections or more	...	...	...	...	...	...	10
--	-----	-----	-----	-----	-----	-----	----

Out of these :—

Positive after the 6th injection	...	...	...	...	...	...	...	...	...	...	4
Negative after the 6th injection	...	...	...	...	...	...	...	...	...	...	6
Negative after the 12th injection	...	...	...	...	...	...	...	...	...	...	2
Number of patients who did not complete the course	...	...	...	...	...	...	...	...	...	...	4

The difficulty of following the effect of any treatment in the outpatient is seen from the previous statistics. For more detailed studies, special investigations and therapeutic trials, which are just starting, cases were admitted to the inpatient wards. The following points are now under study :—

(1) Gastric secretions.

(2) Effect of certain drugs on the disease ; the progress of any method of treatment is controlled by repeated stool examinations and sigmoidoscopy.

(g) *Schistosomiasis*.

*Diagnosis*.—Cases have been met with where the diagnosis of active Bilharziasis was only made after repeated examinations of the excreta. This is frequent in intestinal Bilharziasis, but the swab method overcomes this difficulty especially if carried out after a motion. Nevertheless, in cases where repeated swab examinations were negative and there was a possibility of intestinal Bilharziasis, provocation was resorted to by giving patients a cathartic mainly acting on the colon, on the supposition that irritation of the mucus membrane and also motility of this part of the bowel may help to show some ova in the faeces. This procedure was followed by positive swab in three cases.

In urinary Bilharziasis, two cases showed ova in the urine after a previous negative finding. In the urine, the uneven distribution of ova in the medium is absent.

Other factors must be at work. Investigation of the possible intermittence of passage of Schistosoma ova in the urine was carried out on six patients of various degrees of infection. The urine was taken every four hours and 10 c.c. centrifuged for one minute at 500,0.1 c.c. taken and ova counted (living and dead). This method has been devised to make the results as comparable as possible. The results showed :—

(1) That variation in number of expelled ova occurs. In cases where few ova are expelled, samples are found with no ova.

(2) That the number is at its maximum from 2 p.m. to 6 p.m.

More than one factor must be at work in this variation ; distention of bladder, extent and nature of lesion, number of worms, reaction and specific gravity of urine. On two occasions where ova were not seen in positive cases, the specific gravity of urine were 1005 and 1007 respectively. Possibly, this has led to hatching of the already few ova in the urine with liberation of miracidia which are more difficult to detect.

Provocation was also tried in urinary cases by giving beer and a positive result was found next day in two negative cases.

(1) *Cutaneous Reaction in Schistosomiasis.*

Using the antigen from *Bilharzia bovis* (Khalil and A. Hassan), the reaction was utilised and gave valuable informations in the following conditions :—

1. Every case of Splenomegaly with negative excreta.
2. Every case of renal colic with negative urine and X-ray, to show evidence of previous Bilharziasis.
3. Every case of pure Ancylostomiasis—such cases are carefully chosen for study of pure *Ancylostoma* Anaemia, to exclude previous Bilharziasis.

*Type of Reaction and time of Appearance.*—This corresponds exactly to what was described ; only the redness does not show at all in cases with marked anaemia, but the swelling appears and exceeds 10 mm. as usual in positive cases with pseudopodic processes.

*Ophthalmic Reaction.*—One to three drops of antigen were put in the conjunctiva of 10 cases of positive Bilharziasis ; the other eye left for control ; no reaction occurred at all in all cases neither immediate, up to half an hour, nor delayed.

*Splenic Extract as Antigen.*—The extract is prepared and kindly supplied by Dr. M. F. Sorour on request for various trials. Being of splenomegalic spleens which sometimes contain *Schistosoma* ova or are associated with Bilharziasis especially intestinal, it was thought worth a trial as antigen for cutaneous reaction in *Bilharzia* cases. For this reason, it was injected intracutaneously in various dosages to 20 cases of definite Bilharziasis, urinary and intestinal ; three of these were associated with splenomegaly. A control with the usual antigen was made on the other arm and was positive in all cases, while the splenic extract showed negative reaction in all ; only redness was seen in two cases.

Experimental trials of reaction on animals, to see degree of response during the incubation period of *Bilharzia* infection as well as in one sex infection, are still under investigation.

(2) *Bilharziasis of Seminal Vesicles.*

Three cases presented themselves with bloody spermaturia and frequent emissions during the night. The following investigations were done to these cases with the following results :—

1. None of these gave history of gonorrhoea and discharge after prostatic massage was negative.
2. Cutaneous reaction was positive in all cases and two had urinary Bilharziasis as well, the third was negative.
3. Rectal examination showed that both seminal vesicles are enlarged, irregular and hard ; the prostate was normal in size and consistency, suggesting also non-gonorrhreal nature. In one case a nodule was felt in the left spermatic cord. The epididymis and testis were normal.
4. The two cases positive for urinary Bilharziasis had a full course of Fouadin until they were negative ; the antibilharzial course did not affect the condition of the seminal vesicles. One case reported two months after treatment and the condition was found to be the same. Another case after five months reported improvement (intermission of spermaturia).
5. Bilharzia ova were repeatedly looked for in the discharge after massage of the vesicles with negative results.

(3) *Post Bilharzial Cystitis.*

Cases with persistence of bladder symptoms and pus after complete antibilharzial treatment were put under the following investigations :—

1. Sounding ... ... }
2. X-ray ... ... } to exclude stones or calcifications.

3. Bacteria associated with these conditions were looked for by taking a catheter specimen and this was examined for pathogenic micro-organisms ; six cases out of 22 were positive for bacteria, showing the following organisms :—

B. Coli	...	...	...	...	...	...	...	...	...	...	...	3
Staphylococci	...	...	...	...	...	...	...	...	...	...	...	1
Proteus vulgaris	...	...	...	...	...	...	...	...	...	...	...	1
Pyocyanus	...	...	...	...	...	...	...	...	...	...	...	1

4. Rectal examination to palpate the prostate, seminal vesicles, and any tumour connected with the bladder. This procedure revealed five cases of carcinoma of the bladder out of the 22 studied.

5. Cystoscopy was done in some cases, and repeated during a long period on an inpatient showing the early development and progress of cancer in a Bilharzial bladder.

6. Therapeutic methods tried in these cases are the following :—

(a) *Trypaflavine intravenously*.—a course of every other day injection is given-number and dose depending on age and weight ; some cases reached 12 injections with a maximum dose of 10 c.c. of a 2 per cent solution.

Total number of patients on whom the drug was tried	...	...	14
Complete course of 12 injections	...	...	2
Cured after the 6th injection	...	...	1
Incomplete course	...	...	11

The number of treated cases and re-examinations are still too small for comment. Many cases did not complete the course because of occurrence of unfavourable symptoms from these injections :—

(1) Giddiness... ... ... ... ... ... ... ... ... 8 patients.

(2) Fainting (within 10 minutes) ... ... ... ... ... 3 , ,

(3) Swelling of lactating breast (after 1st injection)... ... 1 , ,  
(recovered after two days).

(4) Pigmentation and some erythema of exposed parts, especially face, occurred in all patients taking more than 5 injections.

(b) *Neo-Salvarsan*.—Owing to its anti-coccal and acidifying properties, this drug has been tried in two cases in small every-other-day-doses of 0.15–0.3 grm. for 6 and 8 doses respectively. In one case, although pus diminished considerably and staphylococci disappeared from the urine, pain increased. This case, controlled by cystoscope, showed developing carcinoma. In second case, *B. coli* was still present after the 8th injection, although the staphylococci disappeared ; and unfortunately this case proved to be cancer later on.

The promising anti-coccal effect of small doses on N.A.B. encourages further trials. Such courses of small doses every other day did not produce toxic symptoms or derange the liver function as tested by galactose.

(c) *Ketogenic Diet*.—An account of the cure of *B. coli* infections of the urinary tract was recently published from the Mayo Clinic and followed by other publications in England. Stimulated by the results recorded, this method was tried on three patients : case 1 was successfully brought to the Ketosis stage, but *B. coli* did not disappear up to 20 days of treatment.

In case 2, it was impossible to produce Ketosis ; this case turned out to be cancer. Case 3 did not continue treatment and was discharged.

This method of treatment is still under investigation ; the objection to it is the difficulty of keeping patients under such diet unless they are co-operating sincerely. Otherwise, no results will be obtained.

(4) *Treatment.*

(a) *Espundal* is an organic antimonial supplied by Schering as white powder in ampoules 0.1 to 0.5 grm. together with ampoules of salt solution 1 to 5 c.c.

According to Prof. C. Schilling, the drug can be injected intramuscularly in gradually increasing doses of 0.1 to 0.5 grm. up to 12 injections without ill after-effects.

Preliminary experiments were done on dogs to determine M.L.D. by both intramuscular or oral routes, the results corresponded to the data supplied.

Five patients were given the drug by intramuscular route. The dose is dissolved in the salt solution supplied. Modification in the dosage was made according to the symptoms produced. The courses, symptoms and results are discussed in the following :—

1. *Urine.*—Two cases were found negative after the 5th injection.

Two cases were found negative after the 6th injection.

One case was found positive after the 7th injection.

(In this case two Fouadin injections were given, as the drug could not be continued owing to pain and symptoms and urine became negative).

Blood and pus remained till the end. A case reported itself repeatedly up to five months with negative urine for ova, but positive for blood and pus.

2. *Pain.*—Local is marked with some induration, but no suppuration ; so that it was needed to vary the site of injection every time. It was so severe that the patients had to sleep on their faces to avoid the contact of the buttocks with the bed. More dilution of the dose with saline was made and pain was found to diminish, suggesting relation to concentration.

3. *Symptoms.*—The following symptoms were observed during treatment :—

- (1) Haematuria increased in one case.
- (2) Headache occurred in two cases after the 4th injection and continued till the end.
- (3) Giddiness occurred in four cases from the 4th injection on.
- (4) Nausea occurred in four cases after the 2nd, 3rd, 4th and 5th injections respectively ; it was associated with marked salivation in two cases.
- (5) Vomiting : occurred in four cases after the 3rd, 4th and 5th injections ; it was repeated after continuation of the same dose in all ; and still continued even after reduction of dose in two cases.

4. *Pulse.*— taken before and half an hour after, did not show any variation.

It can be noted that most of the symptoms occurred after the 4th and 5th injections. They continued during the remaining of the course ; but were less after reduction of dose ; suggesting a cumulative action of the drug..

Owing to the local pain and occurrence of symptoms, no more than two injections were given after the negative result of the urine—the course consisted of 7 to 8 injections.

*Conclusion.*—This drug does not offer any advantage over Fouadin. The local pain is so severe that it cannot be tolerated by most of the patients. Vomiting commonly occurs. The curative value is the same as with Fouadin.

(b) *Fouadin.*

Cases of Bilharziasis admitted to the inpatients wards are treated by the same course as given to the outpatients.

*Effect on Liver.*—The action of antimony on the liver was studied separately as a problem for investigation on account of the reported hepatitis (Cawston) and jaundice (A.A. Ismail), following courses of anti-bilharzial treatment. For this purpose, cases were selected for admission and these come under the following groups :—

1. Bilharzia cases with clinically normal livers.
2. Bilharzia cases with enlarged livers.
3. Bilharzia cases with cirrhotic livers.
4. Bilharzia cases with hepatitis and jaundice.
5. Non-bilharzial cases with hepatitis and jaundice.
6. N.A.B. treated cases for control.

These cases were submitted to the following tests of liver functions before, during and at the end of treatment :—

1. Icterus index.
2. Van den Bergh's reaction, qualitative and quantitative.
3. Galactose test, blood sugar curve and urinary sugar combined.
4. Bromsulphthalein test.
5. Urobilinogen.
6. Roger's test, occasionally.

According to the data observed from these tests, no apparent damage to the liver could be demonstrated after a normal course of Fouadin. Other antimonials were also tried for comparison. For the explanation of some results in these investigations, the glycogen content of the liver in rats kept on standard diet with and without Fouadin course (corresponding to the human course) was estimated. Detailed results will be published later.

*On the Heart :—*

In view of the bradycardia described after the use of some antimonials (Antimosan) and the demonstration of its vagal nature, it was thought advisable to study the action of Fouadin on organic heart disease. For this purpose, cases of Bilharziasis with organic heart diseases (compensating and failing) were submitted to the following investigations, before, during and after their treatment with Fouadin :—

1. Electrocardiogram.
2. Resting pulse rate and blood pressure.
3. Observations of various symptoms and signs.
4. Follow up of some cases.

Seven such cases were up till now studied. The electrocardiographic changes as well as pulse and pressure curves will be commented upon when a sufficient number is available.

## LIST OF PUBLICATIONS OF THE STAFF DURING 1932.

Serial  
Number

97 On some Nematode Parasites from South American Animals.  
Zentralb. f. Bakt. Parasitenkunde, Infekt. Orig., Bd. 123, S. 477-485.  
(Khalil, M. Bey and Vogelsang, E.G.).

98 The Serum Globulin in Human Schistosomiasis.  
Bull. de la Soc. Path. Exot., T. XXV, No. 2, Fev. pp. 140-167  
(Khalil, M. Bey and Hassan, A.).

99 A Preliminary Note on a new Skin Reaction in Human Schistosomiasis.  
The Journal of the Egyptian Medical Association, Vol. XV, No. 4, April, pp. 129-130.  
(Khalil, M. Bey and Hassan A.)

100 The Nature of Pulmonary Lesions in Malaria.  
Archiv. f. Schiffs-und Tropenhygiene, B. 36, H. 5, XXIX, pp. 261-275.  
(Salah el Din, M.)

101 Parasites from Liberia and French Guinea.  
Zeitsch. für Parasitenkunde, Vol. 4, H. 3, Mai, pp. 431-485.  
(Khalil, M. Bey.)

102 Investigation on the Anthelmintic Power of Hexylresorcinol.  
Journal of the Egyptian Medical Association, Vol. XV, No. 9, Sept., pp. 635-637.  
(Abdel Azim, M.).

103 On the Transmission of the Filariasis bancrofti in Egypt.  
Journal of the Egyptian Medical Association, Vol. XV, No. 6, June, pp. 317-322.  
(Khalil, M. Bey, Halawani A. and Hilmy, I.S.).

104 The Parasitic Entity of Aegyptianella pullorum.  
Arch. f. Schiffs-und Tropenhygiene, Heft 7, B. 36, S. 400-407.  
(Salah el Din, M.)

105 Amendment to the name of a Parasite of Man.  
The Journal of the Egyptian Medical Association, Vol. XV, Oct., No. 10, p. 720.  
(Khalil, M. Bey.)

106 On a New Genus of Nematodes Mazzia Mazzia, N.G., N.Sp. from an Argentine Edentate. Septima Reunión de la Sociedad Argentina de Patología Regional del Norte, pp. 1016-1019.  
(Khalil, M. Bey and Vogelsang, E.G.)

107 Bilharzia (Schistosoma) infection in the Mediterranean Basin.  
Folia Medicinae Internae Orientalia, Vol. 1, Fas. I, Dec., pp. 21-29.  
(Khalil, M. Bey.)

ADMINISTRATIVE REPORT.

1. Personnel :—

The personnel of the Research Institute and the Endemic Diseases Hospital, as sanctioned by the Budget of 1932-1933, are as follows :—

Number	Post	Grade	Remarks
1	Director	—	Voluntary Worker.
1	Biochemist	4th	
1	Parasitologist	4th	
1	Medical Entomologist	4th	
1	Clinical Pathologist	5th	
1	Bacteriologist	5th	Vacant
3	Medical Officers	6th	One vacant.
1	Sanitary Engineer	5th	On mission
1	Pharmacist	6th	Vacant.
2	Clerks	8th	
1	Moawin	Hors Cadre.	
1	Molahiz	”	
7	Laboratory Assistants	”	
1	Head Nurse	7th	
5	Nurses	Hors Cadre	
8	Male and Female Attendants	”	

It is hoped that the vacancies on the Staff will be filled in the near future as the work is extending rapidly.

During the year, Dr. S. Madwar, the Medical Entomologist, returned from mission. Dr. M. H. Betache was allowed leave of absence to attend the course for Tropical Medicine and Public Health Diploma in the Faculty of Medicine, Cairo.

2. Training of Medical Staff :

The policy followed is to exercise great care in selecting newly qualified Doctors, specially as regards their aptitude for original observations. They are allowed to work for several months under probation and if they prove satisfactory, the appointment is confirmed. During the period, they gain a general knowledge of the scope of the work. They are then seconded to attend the course for the Diploma of Tropical Medicine and the Diploma in Public Health in the Faculty of Medicine, Cairo.

Those intended for specialisation are further sent in a mission abroad to work in a selected Institute for a sufficient time.

Senior members of the staff are encouraged to take study leave from time to time to keep abreast of the progress of their speciality.

All members of the staff are encouraged to master as many of the modern languages as possible.

3. Training of Laboratory Assistants :—

A course of instruction extending over two months is arranged for candidates of both sexes. Candidates must have at least the Primary Education Certificate. The girls must have the Elementary Education Certificate for girls. Teaching includes the use of the Microscope, the examination of the urine and stools for parasites. A general knowledge on infection, disease, disinfection, weighing and measuring, etc. Those who pass the examination at the end of the course are appointed in the order of merit.

So far, the standard reached by the boys is higher than that of the girls. During the work in the Institute, each Laboratory Assistant becomes specialised in one Department and they are beginning to prove useful and reliable.

4. *Expenditure* :—

The total expenditure during 1932 was L.E. 5105. This includes furniture and equipment bought on the occasion of the official opening of the Institute. The details of the expenditure are as follows :—

	L.E.
Salaries of Permanent Staff	2,439
Salaries of Hors Cadre Staff	1,172
Transport, Travelling Allowance and Expenses	54
Food for Inpatients and Employés	101
Food for Experimental Animals	18
Heat, Light and Water	215
Telegraph and Telephone	15
Equipment, Furniture and Laboratory Material	1,619
Purchase of Experimental Animals	5
Uniforms	4
Petty Expenses	9
<b>TOTAL</b>	<b>5,105</b>

The cooking and washing are carried out by the adjoining Anti-Rabic Institute. The arrangement was resorted to for the sake of economy. Sometimes, however, difficulties arise. It is hoped in the near future to establish a kitchen and a wash house for the service of the Institute.

5. *Buildings* :—

The western fence of the Institute is not yet erected. A new street will be opened between the Institute and the Nile and the necessary expropriation formalities are not yet complete. To the south of the Institute lies a plot of land of about 2100 square metres reserved for the future extension.

6. *Visitors* :—

During the year, the Institute and Hospital were visited by several distinguished people, amongst whom were :—

Dr. P. F. Russell, New York.

Dr. R. Cole, New York.

H. E. Hussein Sirri Bey, Under Secretary of State, Ministry of Public Works.

Prof. Dr. M. Suzuki, Okayama Medical College, Japan.

Prof. Dr. Gutsent, Berlin.

The Director General, Public Health Department, Hedjaz.

7. *Library* :—

Up to the present, the Institute depends upon the Library of the Public Health Department housed in the Public Health Laboratories. The distance between the two Institutes offers material difficulty and an appreciable loss of time. Advantage is taken of the rich Library of the Faculty of Medicine. A permission was granted by H.E. the Dean for the Members of the Staff of the Institute to borrow and consult the Library on the same terms as the staff of the Faculty.

It is hoped in the next Budget that provision will be made to establish a special Library in the Institute.

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